

I. AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

- 1 13. (Original) A semiconductor processing apparatus comprising:
2 a current source;
3 a microprobe coupled to the current source, the microprobe configured to apply a scan
4 current to a semiconductor device on a wafer under a predetermined ambient
5 temperature, the microprobe also configured to capture data concerning performance
6 characteristics of the semiconductor device during the application of the scan current
7 thereto, wherein the scan current is higher than the normal operating current of the
8 semiconductor devices and the predetermined ambient temperature is higher than the
9 normal operating temperature of the semiconductor devices; and
10 a processing module coupled to the microprobe, the processing module configured to
11 receive the data captured by the microprobe and to determine whether the
12 semiconductor device is prone to infant mortality based on the data.
- 1 14. (Original) The apparatus as recited in Claim 13, wherein the semiconductor device is a
2 vertical cavity surface emitting laser (VCSEL) device.
- 1 15. (Original) The apparatus as recited in Claim 13, wherein the microprobe is further
2 configured to repeatedly apply the scan current to the semiconductor device and
3 capture the data concerning performance characteristics of the semiconductor device
4 during each application of the scan current for a predetermined number of times, and
5 wherein the processing module is configured to determine whether the

6 semiconductor device is prone to infant mortality based on a comparison of the data
7 received for said repeated applications of the scan current.

1 16. (Original) The apparatus as recited in Claim 13, which is configured to process a
2 plurality of said semiconductor device on the wafer.

1 17. (Original) The apparatus as recited in Claim 16, which is further configured to process
2 said plurality of said semiconductor device one at a time in serial fashion.

1 18. (Original) The apparatus as recited in Claim 16, which is further configured to process a
2 subset of said plurality of said semiconductor device simultaneously, wherein said
3 subset includes more than one but not all of said plurality of said semiconductor
4 device on the wafer.

1 19. (Original) The apparatus as recited in Claim 13, wherein the microprobe is further
2 configured to apply the scan current to the semiconductor device for as long as 20
3 milliseconds (ms).

1 20. (Original) The apparatus as recited in Claim 13, wherein the microprobe is further
2 configured to apply the scan current of substantially higher than 20 milliamperes
3 (mA) to the semiconductor device.

1 21. (Original) The apparatus as recited in Claim 13, wherein the microprobe is further
2 configured to apply the scan current of as high as 50 milliamperes (mA) to the
3 semiconductor device.

1 22. (Original) The apparatus as recited in Claim 13, wherein the microprobe is further
2 configured to apply the scan current to the semiconductor device using a current
3 sweeping mode.

1 23. (Original) The apparatus as recited in Claim 13, wherein the microprobe is further
2 configured to apply the scan current to the semiconductor device using a current
3 pulsing mode.

1 24. (Original) A system for burning-in semiconductor devices, comprising:
2 a processor; and
3 a mechanical module coupled to and controlled by the processor, wherein the
4 mechanical module is configured to (1) apply a scan current to the semiconductor
5 devices on a wafer; (2) capture data concerning performance characteristics of the
6 semiconductor devices during the application of the scan current thereto, wherein the
7 scan current is higher than the normal operating current of the semiconductor
8 devices; and wherein the processor is configured to receive the data captured by the
9 mechanical module for determining whether the semiconductor device is prone to
10 infant mortality.

1 25. (Original) The system as recited in Claim 24, which is configured to process vertical
2 cavity surface emitting laser (VCSEL) devices.

1 26. (Original) The system as recited in Claim 24, wherein the mechanical module is further
2 configured to repeatedly apply the scan current to the semiconductor devices and
3 capture the data concerning performance characteristics of the semiconductor
4 devices during each application of the scan current for a predetermined number of
5 times, and wherein the processor is further configured to determine whether the
6 semiconductor device is prone to infant mortality based on a comparison of the data
7 received for said repeated applications of the scan current.

1 27. (Original) The system as recited in Claim 24, which is configured to process the
2 semiconductor devices one at a time in serial fashion.

1 28. (Original) The system as recited in Claim 24, which is configured to process a subset of
2 the semiconductor devices simultaneously, wherein said subset includes more than
3 one but not all of the semiconductor devices on the wafer.

1 29. (Original) The system as recited in Claim 24, wherein the mechanical module is further
2 configured to apply the scan current to the semiconductor devices for as long as 20
3 milliseconds (ms).

1 30. (Original) The system as recited in Claim 24, wherein the mechanical module is further
2 configured to apply the scan current of as high as 50 milliamperes (mA) to the
3 semiconductor devices.

1 31. (Original) The system as recited in Claim 24, wherein the mechanical module is further
2 configured to apply the scan current to the semiconductor devices in a current
3 sweeping mode.

1 32. (Original) The system as recited in Claim 24, wherein the mechanical module is further
2 configured to apply the scan current to the semiconductor devices in a current
3 pulsing mode.

1 43. (New) In a process for manufacturing a semiconductor device that has performance
2 characteristics that may vary during the initial period of operation, a method for
3 stabilizing the device comprising:

- 4 a. applying a test current to the semiconductor device for a brief period of time; and
- 5 b. repeating step (a) above at an incremental current over the test current until the test
6 current is above the normal operating current of the semiconductor device.

1 44. (New) The method of claim 43, further comprising providing an elevated ambient
2 temperature for the semiconductor device during the steps of providing a sequence of
3 test currents.

1 45. (New) The method of claim 44, wherein the dwell time of each application of a test
2 current is about 15 ms.

1 46. (New) The method of claim 43, wherein the number of cycles of providing a test
2 current is about four.

1 47. (New) The method of claim 43, wherein the semiconductor device is a vertical
2 cavity surface emitting laser and the step of providing a test current to said semiconductor
3 device further includes sequentially providing a sequence of test currents, to each of the
4 vertical cavity surface emitting lasers on a wafer under test.

1 48. (New) The method of claim 43, wherein the scan current ramp rate, the number of
2 scans per device, the dwell time, the peak value of input current, and the ambient
3 temperature are adjusted for each process.